CBCS SCHEME

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18AI72

Seventh Semester B.E. Degree Examination, Dec.2023/Jan.2024
Advanced Machine Learning

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Explain the steps for building machine learning models. **(10 Marks)**

b. Explain Ridge Regression, LASSO Regression and Elastic Net Regression. **(10 Marks)**

OR

2 a. Briefly explain Auto-Regressive (AR) models with respect to forecasting. **(10 Marks)**

b. Discuss how Dicky-Fuller Test and differencing helps to find out if a time series is stationary in ARIMA model. **(10 Marks)**

Module-2

3 a. Show that how evaluation problem and learning problem issues are addressed by Hidden Markov Model. **(10 Marks)**

b. For the given set of points, apply the clusters using agglomerative algorithm clustering : average link, use Euclidian distance and draw final cluster formed.

Data object		
Points	A	B
P1	1	1
P2	1.5	1.5
P3	5	5
P4	3	4
P5	4	4
P6	3	3.5

(10 Marks)

OR

4 a. Explain the steps involved in K means clustering algorithm along with its advantages and disadvantages. **(10 Marks)**

b. Using K-Medoids Algorithm solve the problem for the following dataset of 6 objects as shown in the table below into clusters, for K = 2.

Data object		
Sample	Points	
X1	2	6
X2	3	4
X3	3	8
X4	4	2
X5	6	2
X6	6	4

Note : Randomly select 2 medoids cluster centers. **(10 Marks)**

Module-3

5 a. Discuss association rule mining and explain how each rule is measured with a set of metrics. **(10 Marks)**

b. With an example, explain the steps involved in user-based similarity algorithm. **(10 Marks)**

OR

6 a. Explain Count Vector Model helps to identify the importance of words in a BoW model. **(10 Marks)**

b. Build a classification model using the TF-IDF vectors and
i) Create the confusion matrix
ii) Find out the precision and recall for positive sentiment cases. **(10 Marks)**

Module-4

7 a. With a neat diagram explain types of neural network architecture. **(07 Marks)**

b. With a diagram briefly explain different types of learning process involved in the neural network. **(06 Marks)**

c. Solve ANDNOT function using McCulloch-Pitts neuron. **(07 Marks)**

OR

8 a. What are the appropriate types of problems in which artificial neural networks can be applied? **(06 Marks)**

b. Briefly explain the following with respect to back propagation :
i) Representational Power of Feedforward Networks
ii) Generalization, Overfitting and Stopping Criterion. **(08 Marks)**

c. Describe prototypical genetic algorithm with an example. **(06 Marks)**

Module-5

9 a. Explain central limit theorem with respect to general approach for deriving confidence intervals. **(10 Marks)**

b. Briefly explain the two techniques required in Comparing learning algorithms. **(10 Marks)**

OR

10 a. Explain the distance-weighted nearest neighbor algorithm. **(10 Marks)**

b. Briefly explain how reinforcement learning problem differs from other function approximation tasks. **(10 Marks)**

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